# Application of Korea SimSmoke to Develop Tobacco Control Strategies

Sung-Il Cho

Seoul National University Graduate School of Public Health

SNU Health

Graduate School of Public Health

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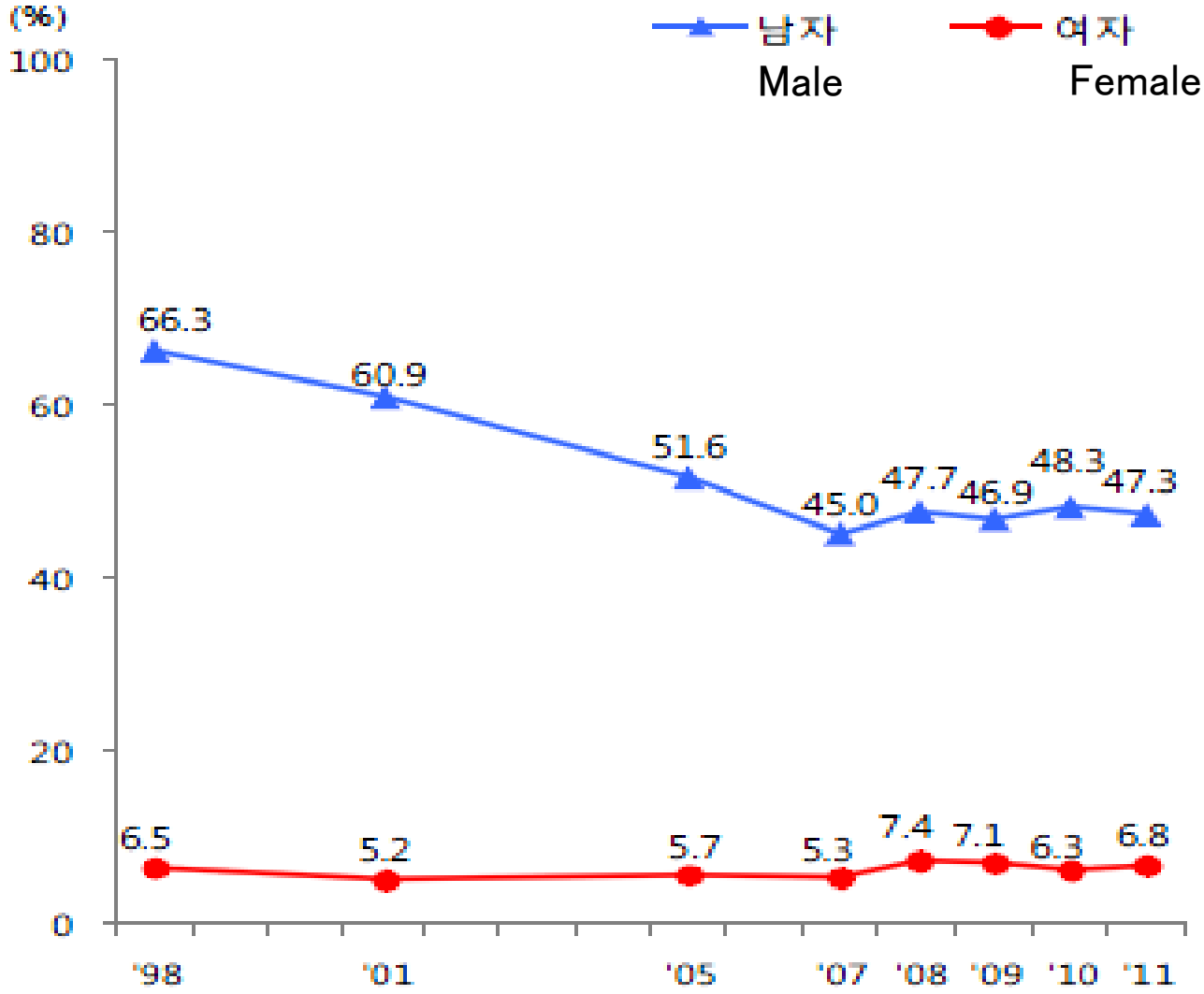
# 그림 1-1. 현재흡연율 추이 Trends in Current Smoking (%)




※현재흡연율 : 평생 담배 5갑(100개비) 이상 피웠고 현재 담배를 피우는 분율, 만19세이상

※'98년 만20세이상

※2005년 추계인구로 연령표준화

Korea National Health Exam & Nutrition Surveys (KNHANES)

# Policy Goals for Male Smoking

- Health Plan 2010: 30% (MoH, 2001)

→ In fact, it turned out to be 48.3%

- Health Plan 2020: 29% (MoH, 2011)
- Is this a feasible goal now?
- Or should it be somewhere > 30%?

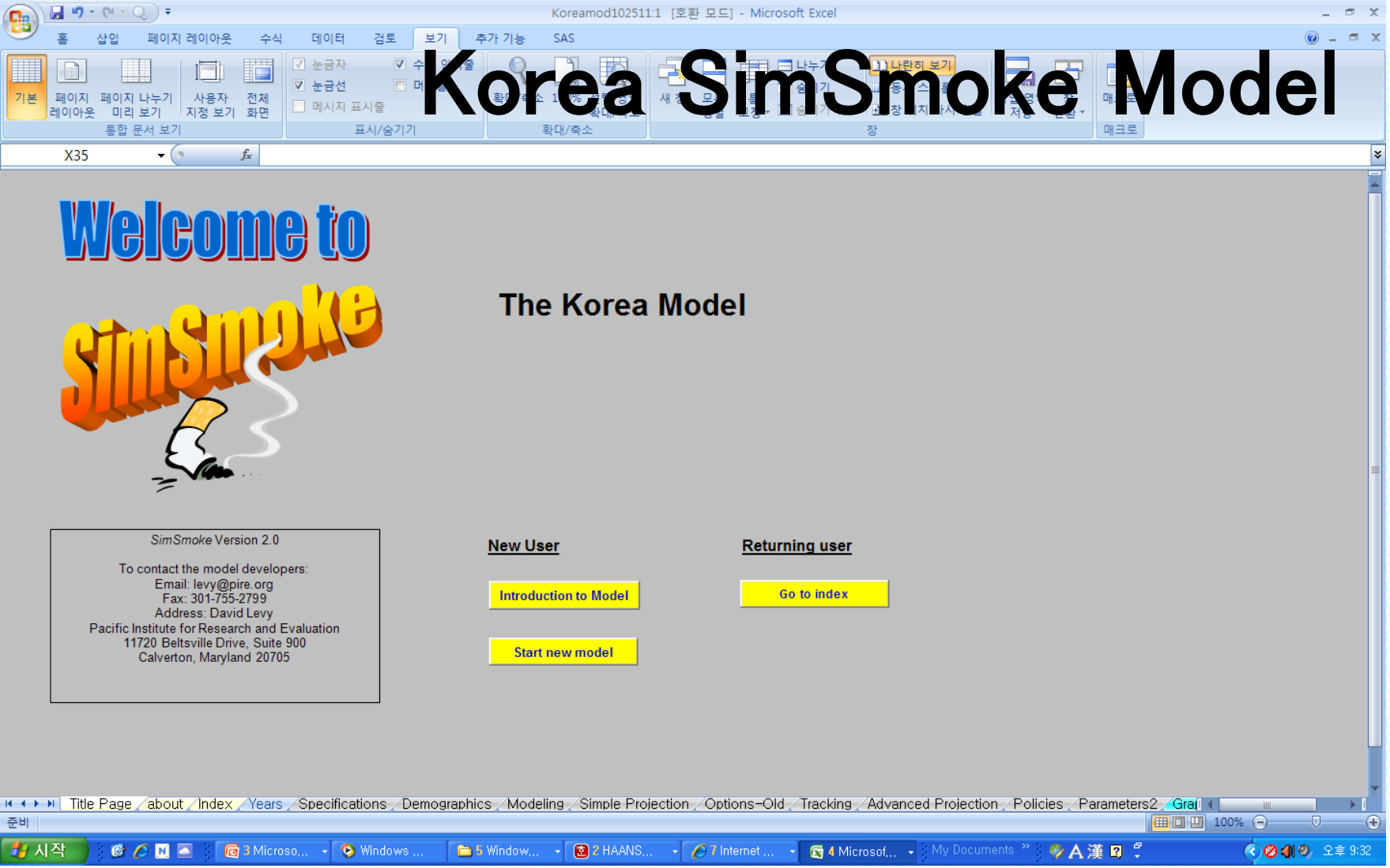
# Need for a Strategy

- What should be done to achieve the male smoking prevalence goal ≤29% by 2020?
- Should we just try our best in every way?
- Or would any strategic planning help?
  - More specific objectives, priorities, etc.

# SimSmoke

- A **simulation model** for tobacco policy analysis and evaluation
- Developed by **David T. Levy**
- Simulates the dynamics of **smoking rates** and **smoking-attributed deaths** in a State or Nation, and the effects of policies on those outcomes.
- Applied to many countries: **US, Albania, Argentina, Netherlands, Taiwan, Thailand, Vietnam, Korea, etc.**

# Korea SimSmoke Model




## SimSmoke Model Evaluation of the Effect of Tobacco Control Policies in Korea: The Unknown Success Story (AJPH, 2010)

David T. Levy, PhD, Sung-il Cho, MD, ScD, Young-Mee Kim, MPH, Susan Park, RN, MPH, Mee-Kyung Suh, EdD, and Sin Kam, MD, PhD

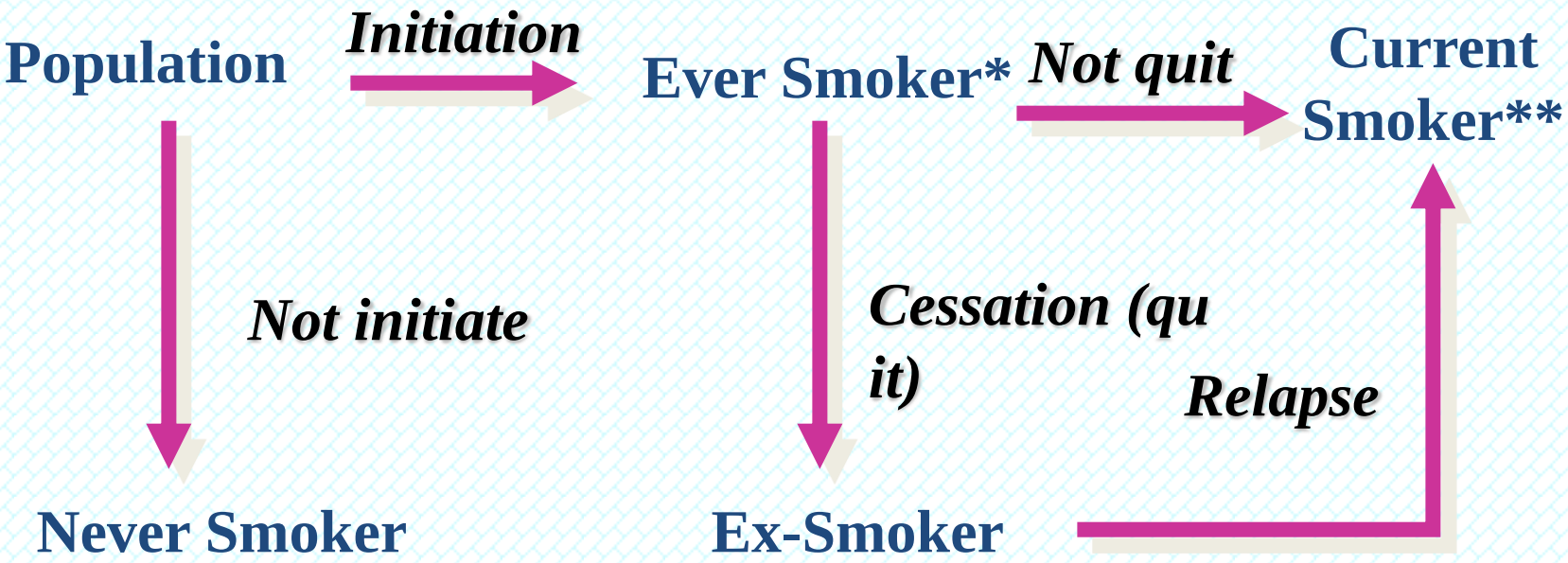
# Basic Structure of Model (Levy, 2011)

- **Population model** begins with initial year population (by age and gender) and moves through time (by year) with births and deaths (1st order discrete Markov process)

- **Smoking model** distinguishes population in never smokers, smokers, and ex-smokers and moves through time with initiation, cessation and relapse (Markov)

- **Policy modules**- one for each policy with interdependent effects on smoking rates

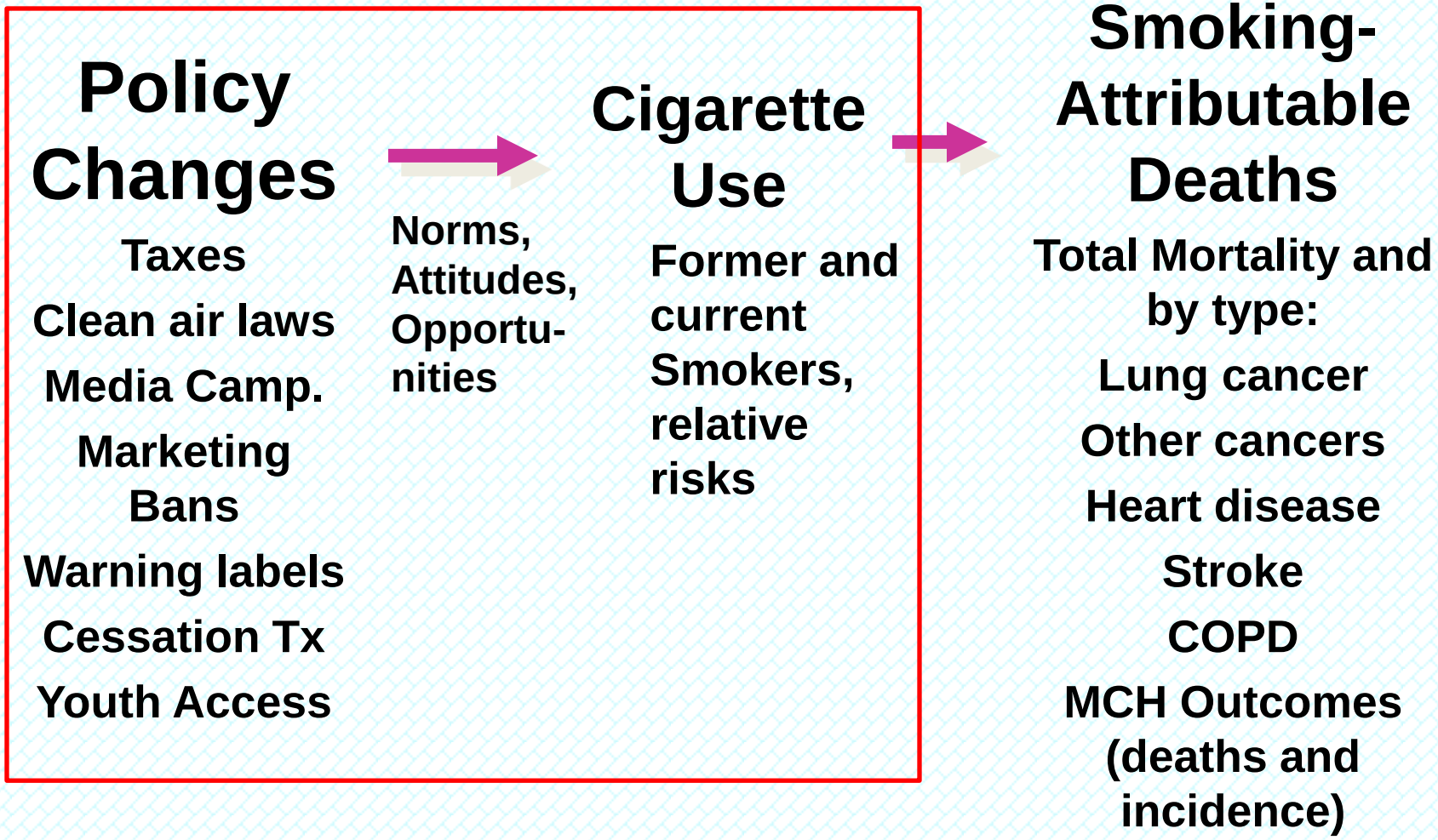
# Smoking Model: Evolution of Smokers (Levy, 2011)




** Usually as smoked 100 cigarettes lifetime* *** usually as smoked some or all days*

**Parameters were estimated from age and gender specific smoking prevalence data from KNHANES surveys (Korea National Health and Nutrition Surveys)**

# Policy Effects Derived from Literature




(Levy, 2011)

**TABLE 1—Tobacco Control Policies and Effect Sizes for Korea SimSmoke Model**

| Policy | Description | Effect[a] |
|---|---|---|
| Taxation effect,[b] by age group | Cigarette price index, taxes measured in absolute terms | |
| 15–17 y | | −0.4 |
| 18–24 y | | −0.3 |
| 25–34 y | | −0.2 |
| ≥35 y | | −0.1 |
| Worksites, % | | |
| Total ban | No smoking anywhere on site | 6.0 |
| Partial ban | Smoking limited to nonventilated common area | 2.0 |
| Restaurants, % | | |
| Total ban | No smoking anywhere in any indoor restaurants | 1.0 |
| Partial ban | Ban in all restaurants except in designated areas | 0.5 |
| Total bans in other places, % | Ban in 3 of 4 (malls, retail stores, public transport, and elevators) | 1.0 |
| Mass media campaigns, % | | |
| High publicity intensity | Campaign publicized heavily on TV (≥2 months of the year) and at least some other media | 6 |
| Medium publicity intensity | Campaign publicized sporadically on TV and in at least some other media, plus a local program | 3.2 |
| Low publicity intensity | Campaign publicized only sporadically in newspaper, on billboards, or in other media | 1.2 |
| Cessation treatment, % | Complete reimbursement of pharmacological and behavioral treatments, quit lines, and brief interventions | 2.6 (prevalence), 50 (cessation rate) |

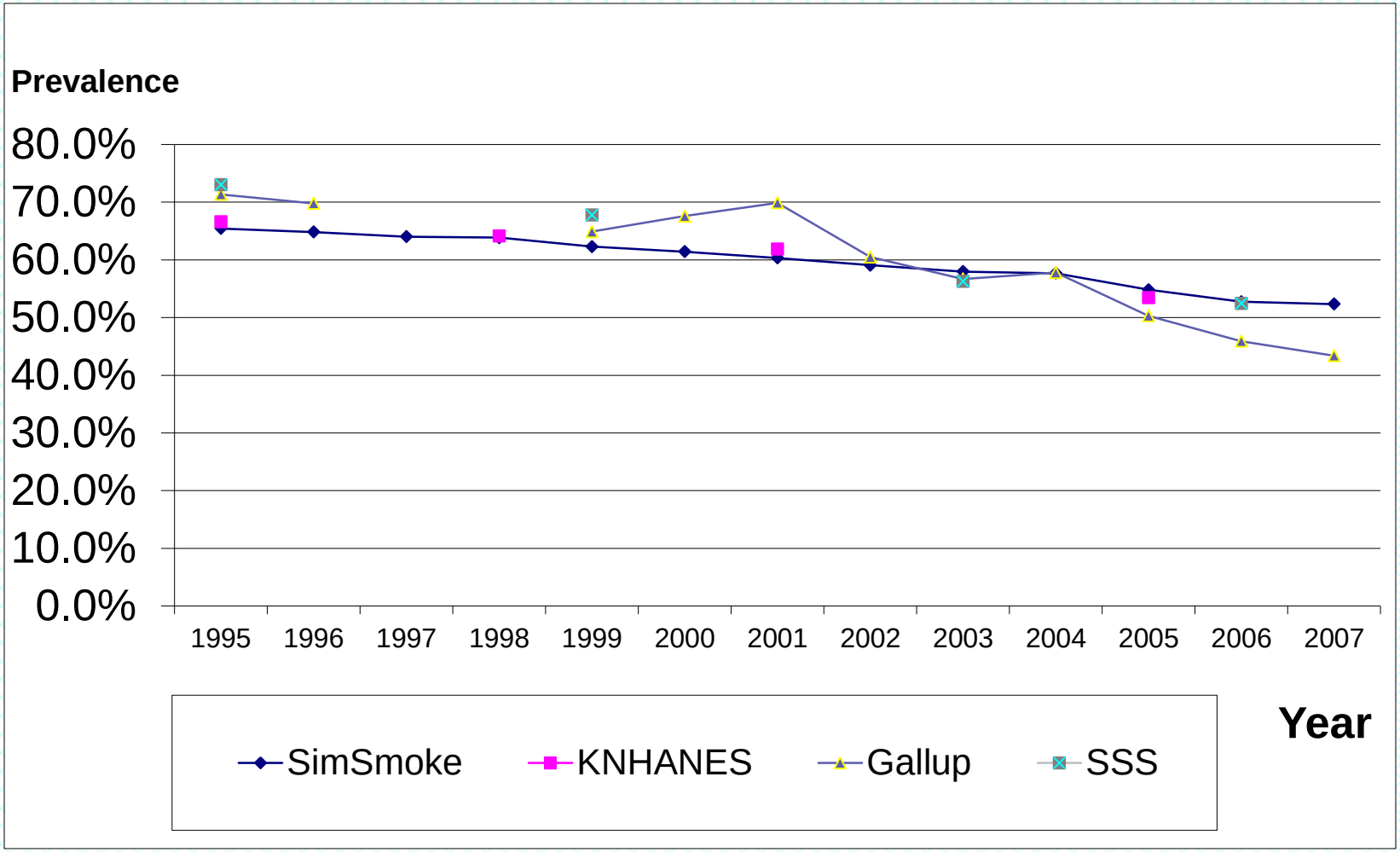
# Assessment of Policy Levels

## by Policy Documents and Expert Consultations

**TABLE 2—Tobacco Control Policies in the Republic of Korea: 1995–2006**

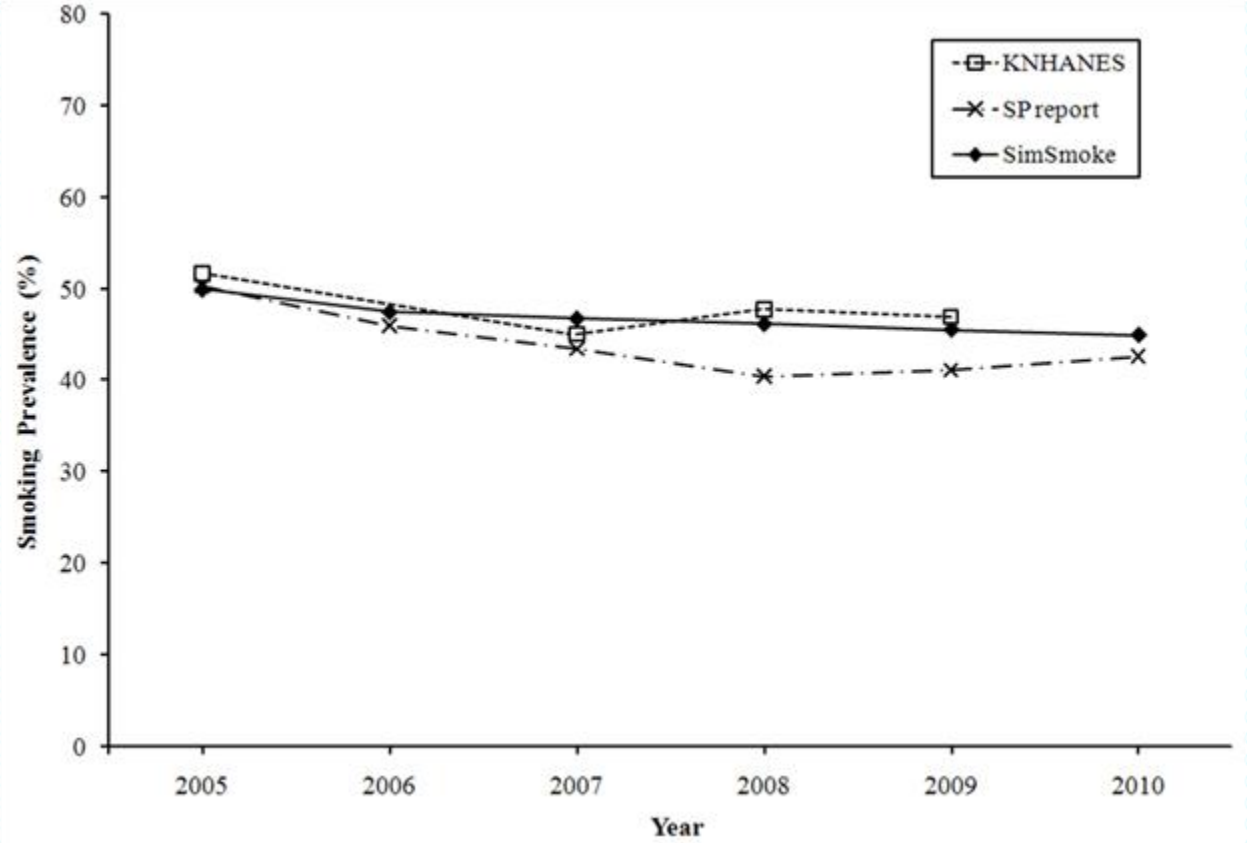
| Policy[a] | | 1995 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Inflation-adjusted price,[b] $ | Raise tax | 1.51 | 1.63 | 1.85 | 1.81 | 1.95 | 2.16 | 2.11 | 2.04 | 2.52 | 2.47 |
| Media campaign publicity intensity | Warn(M) | Low | Low | Low | Medium | Medium | Medium | Medium | Medium | Medium | High |
| Clean air laws,[c] % | Protect | | | | | | | | | | |
| Separate smoking areas in worksites | | 0 | 0 | 0 | 0 | 0 | 0 | 0.5 | 0.5 | 0.5 | 0.5 |
| Separate smoking areas in restaurants | | 0 | 0 | 0 | 0 | 0 | 0 | 0.75 | 0.75 | 0.75 | 0.75 |
| Smoking bans in other public places | | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 50 | 1 | 1 | 1 | 1 |
| Advertising restrictions | Enforce | Low level | Low level | Low level | Low level | Low level | Low level | Low level | Low level | Low level | Low level |
| Health warnings | Warn(P) | Low level | Low level | Low level | Low level | Low level | Low level | Low level | Low level | Low level | Low level |
| Cessation treatment | Offer | | | | | | | | | | |
| Coverage by national health insurance | | None | None | None | None | None | None | None | None | None | Weak |
| Physician interventions | | None | None | None | None | None | None | None | None | None | None |
| Quit line | | None | None | None | None | None | None | None | None | None | Present |

# Model Validation:
# Korea Male Smoking Prevalence




(Levy & Cho, 2008)

# Korea Males: update



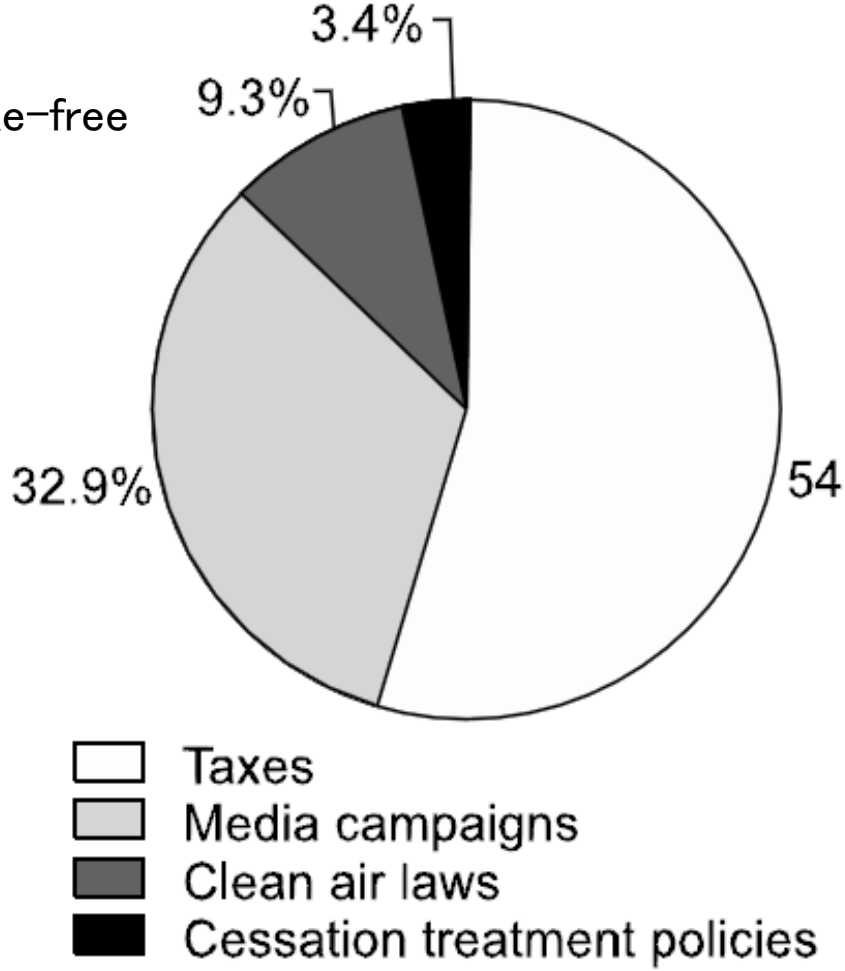

(Levy & Cho, 2011)

# Policy Evaluation: Dissection of Effects

**Offer:** Cessation clinics (assessed prior to be fully effective)

**Protect:** Smoke-free Areas

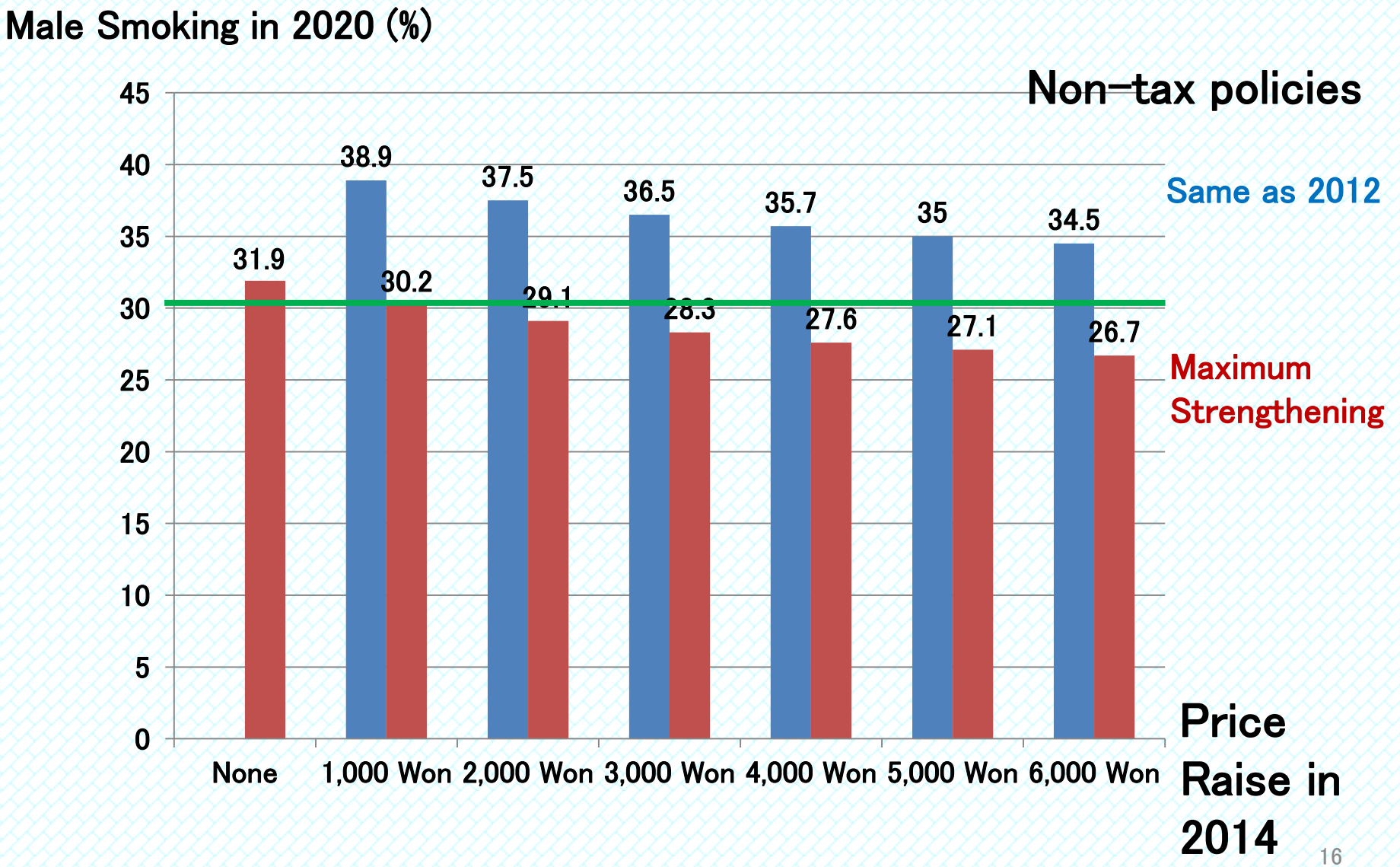
**Warn:** Media Campaign




**Raise:** Taxes

**Figure 3.** Effect of policies in reducing male smoking prevalence between 1995 and 2006.

# Prediction by Tax Policy Scenarios

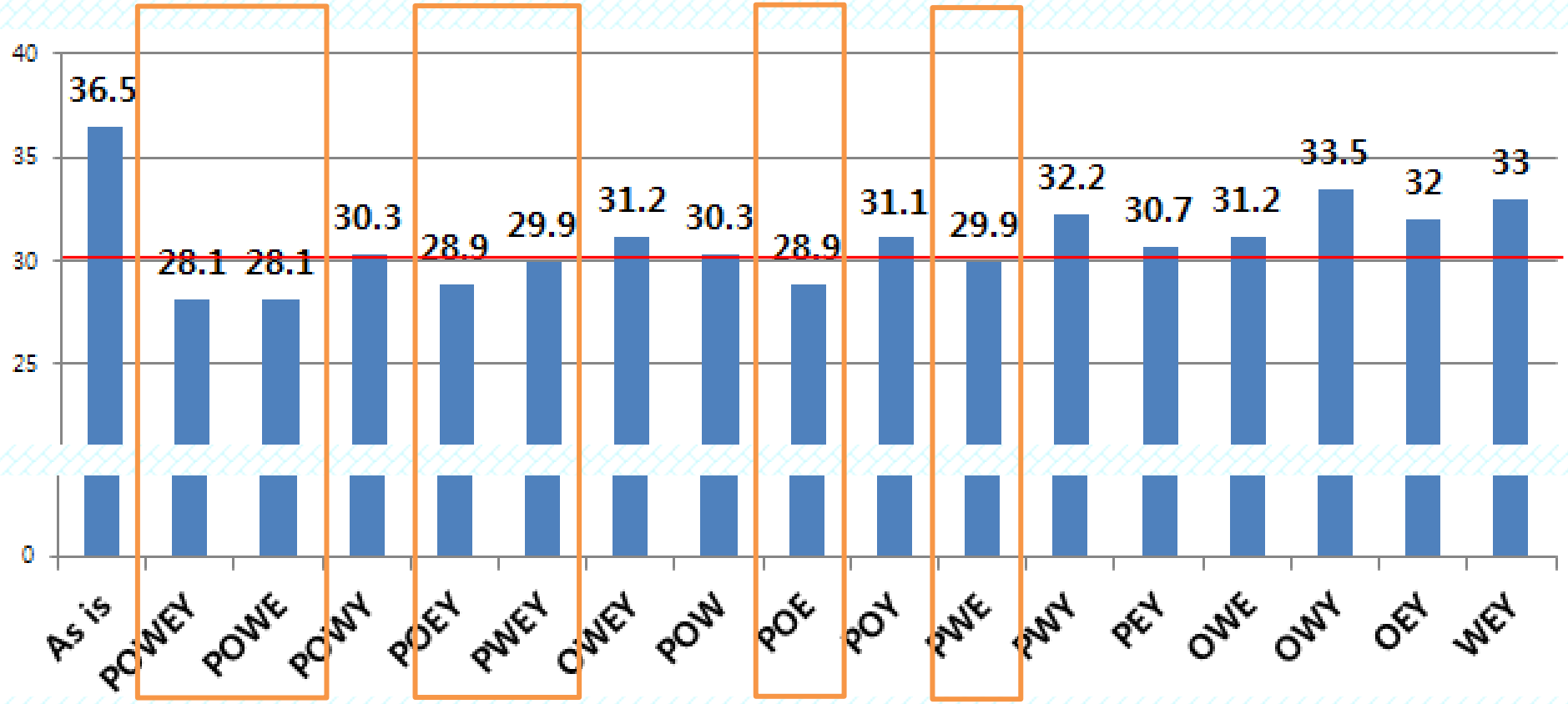


# Tax Policy Strategy

- Tax alone, or Non-tax policy alone, is NOT sufficient for 2020 goal
- At least 2,000 won (≒2 USD) price raise is needed even with maximum non-tax policies (75-80% tax fraction of total price)
- Less-than-maximum non-tax policies would require even greater tax raise

# Non-Tax Policy Combinations

## Given 2,000 Won Tax Raise




Combining <u>Full Extent</u> of

Protect (clean air), Offer (cessation tx), Warn (media campaign),

Enforce (marketing bans), Youth (access limit)

# Non-Tax Policy Strategy

- For a successful strategy, **Protect (clean air),** and **Enforce (marketing ban)** MUST be included to their maximum
- The more, the better!
- Offer (cessation Tx) > Warn (Media, Packaging) > Youth (access limit)
- All effective policies must be strengthened and maintained to the maximum eventually, for a **smoke-free world**.

# Conclusions

- SimSmoke simulation helps to develop a strategy for tobacco control policy
- To achieve 2020 policy goal of male smoking prevalence ≤29%, tax raise is needed by at least 2,000 won, in combination with non-tax policies
- Full-extent strengthening of Protect (clean air) and Enforce (market bans) are of high priority
- Offering cessation treatment and greater Warnings are also important
- GOOD NEWS: Most importantly, it IS possible to achieve our goal, IF we work hard enough!

# Thank You for Your Attention!